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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,355	02/11/2002	Karen A. Moore	B-128	5743
7590 08/11/2004				
Stephen R. Christian P. O. Box 1625 Idaho Falls, ID 83415-3899			EXAMINER FLETCHER III, WILLIAM P	
			ART UNIT 1762	PAPER NUMBER
DATE MAILED: 08/11/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/074,355

Applicant(s)

MOORE ET AL.

Examiner

William P. Fletcher III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13,14,16-21,23-31 and 69-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-31,69-76,78 and 79 is/are rejected.
- 7) ☒ Claim(s) 77 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment and response, filed 5/21/2004, cancelled claims 1-12, 15, 22, and 32-68, and added new claims 69-80. Claims 13, 14, 16-21, 23-31, and 69-80 are pending.

Response to Arguments

2. Applicant's arguments, see the above-mentioned response, with respect to the rejection(s) of claim(s) 13-31 over the prior art, have been fully considered and are persuasive. Applicant has amended independent claim 13 to recite limitations not taught by Matsunaga alone. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the reference cited below. Several of applicant's arguments are still relevant to the new rejections and are addressed below.
3. Applicant argues that, because Matsunaga exemplifies deposition of the insulating material by incorporating the oxide material in a resin, that such an arrangement is incompatible with the plasma spraying method of Matsumoto.

The examiner notes that Matsunaga's means of depositing the insulating material is not limited to the spray, brush, or roller coating disclosed. These are merely *examples*. Matsumoto clearly teaches that Matsunaga's oxide insulating materials may be deposited by plasma spraying. Since the conductive layer of Matsunaga is deposited by plasma spraying, it is clear that this method of is amenable to plasma deposition. Further, by utilizing the same type of deposition process (i.e., plasma spraying) for both the conducting layer and the insulating layer, the overall process is greatly simplified. Consequently, this argument is not persuasive.

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4. Applicant argues that, because Matsumoto teaches coating the outside of a hollow article, it is not combinable with the other references teaching coating the inside of a hollow article.

As noted above, the examiner relies upon Matsumoto exclusively as teaching that the insulating oxide materials of Matsunaga can be deposited by plasma spraying. Whether Matsumoto utilizes this method to coat the inside or outside of a hollow article is irrelevant, as it does not effect the teaching that such materials may be deposited by flame spraying. Further, Matsumoto's coating of the inside of a hollow object would not have changed the suggestion to one of ordinary skill in the art that the insulating oxides of Matsunaga can be deposited by flame spraying. Consequently, this argument is not persuasive.

5. Applicant further argues that, because Rubenstein teaches a moving spray gun and Muehlberger teaches a stationary spray gun, it would not have been obvious to combine these references.

The examiner relies on Muehlberger exclusively as teaching cooling of a plasma spray gun to prevent damage thereto. Whether this gun is stationary or moving is irrelevant. The advantage to cooling the gun still exists. Consequently, this argument is not persuasive.

6. Lastly, applicant repeatedly suggests that the references are non-analogous art.

The examiner disagrees. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, all of the references are drawn to the spray coating of the inside of a hollow article, or some

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aspect attendant the methods disclosed in the references. Consequently, this argument is not persuasive.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. **Claims 13, 23-26, 29-31, and 73-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunaga et al. (US 6,197,168 B1) in view of Rubenstein (US 4,704,985 A) and Ivey (US 2,488,195 A).**

Matsunaga teaches a method in which a layer of conductive material is deposited on the interior surface of a pipeline (3:25-35 and 13:58-14:13). While this reference discloses that the conductive layer may be deposited by a variety of spraying methods including plasma spraying (15:6-14).

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Matsunaga does not explicitly teach the specifics of the spraying recited in the independent claim.

Rubenstein teaches a method in which the interior surface of a hollow article is spray-coated utilizing a spray gun. The spray gun is attached to an extension arm, inserted into the interior area of the hollow article, and operated, while moving the spray gun, to spray said interior surface (abstract and Fig. 1). Such method results in long service life with little wear on the few moving parts of the coating apparatus (1:1-65). This reference does not specify a particular type of spray gun (6:5-20).

It would have been obvious to one of ordinary skill in the art to modify the method of Matsunaga so as to spray the insulating material according to the method of Rubenstein (i.e., by mounting the plasma spraying nozzle on the end of a lance, inserting the lance into the pipe, and moving the nozzle via the lance while spraying). One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the interior surface of the hollow article with the conductive material utilizing an apparatus with a long service life, little wear, and few moving parts.

Ivey teaches a spray gun including a zone of reduced air pressure disposed proximate thereto. (Fig. 2 and 1:29-3:50). The reduced air pressure zone serves to collect and recycle overspray (1:6-11). Because the gun of Ivey is a unitary assembly, the gun and the reduced air pressure zone move together.

Matsunaga teaches plasma spraying of the conductive material. Rubenstein does not place any limitation on the type of nozzle that may be attached to the movable lance. Consequently, one of ordinary skill in the art would have looked to the prior art for examples of

suitable nozzles. It would have been obvious to one of ordinary skill in the art to further modify the method of Matsunaga so as to provide a zone of reduced air pressure proximate the spray gun, said zone moving with the spray gun, as suggested by Ivey. Although the nozzle of Ivey is not explicitly disclosed as a plasma spray nozzle, the principle taught by Ivey is the same: a plasma spraying process generates overspray of excess coating material. Providing a zone of reduced air pressure proximate the spray gun collects the overspray and reduces waste.

With specific respect to claim 24, Ivey teaches that the overspray is drawn in the direction of arrows 30 and 40 (see Fig. 2). The direction of these arrows is clearly directly opposite to the direction of spray indicated by arrow 90.

With specific respect to claim 25, Rubenstein explicitly teaches that various tubes for the spray gun may be disposed within the lance (6:5-20). Since Ivey teaches that overspray is withdrawn from the spray gun via a tube leading back to a recycling/supply area (see Fig. 1), it would have been obvious to one of ordinary skill in the art to situate the overspray transport tube within the extension arm.

With specific respect to claims 29-31 and 76, none of the cited references explicitly teach flushing the interior of the pipe with cooling air. Nevertheless, it would have been obvious to do so in order either to achieve the supercooling taught in the reference or to cool the substrate after thermal spraying so as to allow handling and further processing. Such cooling air or cooling air and water being advantageously introduced from either the extension arm or another conduit, as both are equivalent means of introducing the cooling gas.

With specific respect to claim 73, Rubenstein teaches rotating the hollow article while coating (1:55-56).

With respect to claims 74 and 75, insofar as this combination of references involves the artisan's coating the hollow article in a predetermined fashion and to a predetermined thickness, it is the examiner's position that the limitations of these claims are met.

10. **Claims 14, 16-19, 69-72, and 78-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunaga et al. (US 6,197,168 B1) in view of Rubenstein (US 4,704,985 A) and Ivey (US 2,488,195 A), as applied to claim 13 above, and further in view of Matsumoto et al. (US 5,024,423 A).**

The combined teaching of Matsunaga, Rubenstein, and Ivey is detailed above. While Matsunaga teaches that the *conductive* material may be applied by thermal spraying (inclusive of plasma spraying) from a spray gun (15:6-13), this reference does not explicitly require a particular means of application of the *insulating* material. (The recited spraying method of the insulating material in these claims is identical to that of the conductive material, recited in claim 13, addressed above.)

The examiner notes that Matsunaga's the insulating material may be an oxide such as alumina, zirconia, titania, and silica (14:1-13). Consequently, one of ordinary skill in the art would have looked to the prior art to find a suitable method of application of these materials. Matsumoto teaches that such materials may be applied to a substrate by plasma spraying from a spray gun (2:45-3:12 and claim 5).

It would have been obvious to one of ordinary skill in the art to modify the method of Matsunaga in view of Rubenstein and Ivey so as to apply the insulating material by thermal (plasma) spraying from a spray gun, as suggested by Matsumoto. One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully coating the

insulating material. It would have been further obvious to one of ordinary skill in the art to utilize the same spray gun and method as that disclosed by Rubenstein in view of Ivey so as to eliminate the need for additional components of the coating apparatus.

With specific respect to claim 17, Ivey teaches that the overspray is drawn in the direction of arrows 30 and 40 (see Fig. 2). The direction of these arrows is clearly directly opposite to the direction of spray indicated by arrow 90.

With specific respect to claim 18, Rubenstein explicitly teaches that various tubes for the spray gun may be disposed within the lance (6:5-20). Since Ivey teaches that overspray is withdrawn from the spray gun via a tube leading back to a recycling/supply area (see Fig. 1), it would have been obvious to one of ordinary skill in the art to situate the overspray transport tube within the extension arm.

With specific respect to claim 69, Rubenstein teaches rotating the hollow article while coating (1:55-56).

With specific respect to claims 70-71, insofar as this combination of references involves the artisan's coating the hollow article in a predetermined fashion and to a predetermined thickness, it is the examiner's position that the limitations of these claims are met.

With specific respect to claim 78, Matsunaga teaches a plurality of conductive traces (2a and 2b in Fig. 3).

With specific respect to claim 79, Matsunaga teaches deposition of the conductive layer atop the insulating layer (see Fig. 18, where layer 1b is insulating and layer 2 is conductive).

With specific respect to claim 80, as noted with respect to claims 78 and 79, Matsunaga teaches a plurality of conductive layers disposed atop insulating layers.

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11. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunaga et al. (US 6,197,168 B1) in view of Rubenstein (US 4,704,985 A), Ivey (US 2,488,195 A), and Matsumoto et al. (US 5,024,423 A), as applied to claim 19 above, and further in view of Muehlberger (US 3,740,522 A).

The combined teaching of Matsunaga, Rubenstein, Ivey, and Matsumoto is detailed above. None of these references explicitly state that the thermal (plasma) spray gun is cooled.

Muehlberger teaches a thermal (plasma) spray gun that is water cooled to prevent overheating and, by extension, damage to the gun (7:37-9:53).

It would have been obvious to one of ordinary skill in the art to modify the method of Matsunaga, Rubenstein, Ivey, and Matsumoto, so as to cool the thermal (plasma) gun. One of ordinary skill in the art would have been motivated by the desire and expectation of avoiding damage to the gun by preventing overheating.

With specific respect to claim 21, none of the cited references explicitly state separately cooling the extension arm. Doing so would have also been obvious to one of ordinary skill in the art to prevent damage from overheating.

12. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunaga et al. (US 6,197,168 B1) in view of Rubenstein (US 4,704,985 A), and Ivey (US 2,488,195 A), as applied to claim 19 above, and further in view of Muehlberger (US 3,740,522 A).

The combined teaching of Matsunaga, Rubenstein, and Ivey is detailed above. None of these references explicitly state that the thermal (plasma) spray gun is cooled.

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Muehlberger teaches a thermal (plasma) spray gun that is water cooled to prevent overheating and, by extension, damage to the gun (7:37-9:53).

It would have been obvious to one of ordinary skill in the art to modify the method of Matsunaga, Rubenstein, and Ivey, so as to cool the thermal (plasma) gun. One of ordinary skill in the art would have been motivated by the desire and expectation of avoiding damage to the gun by preventing overheating.

With specific respect to claim 28, none of the cited references explicitly state separately cooling the extension arm. Doing so would have also been obvious to one of ordinary skill in the art to prevent damage from overheating.

Allowable Subject Matter

13. Claim 77 is objected to as being dependent upon a rejected base claim (23), but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Matsunaga represents the closest prior art. Because this reference relies on the direct contact of water or other fluids with the conductive trace, there is no teaching or suggestion of spraying an insulating layer atop this conductive trace.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William P. Fletcher III whose telephone number is (571) 272-1419. The examiner can normally be reached on Monday through Friday, 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William P. Fletcher III
William P. Fletcher III
Examiner
Art Unit 1762
Shrive P. Beck
SHRIVE P. BECK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700